707.7

CONCRETE:

This material shall consist of burlap impregnated on one side with white opaque plastic film. The plastic film shall be securely bonded to the burlap. The film shall be clean and free of imperfections. Acceptance will be based on visual inspection.

707.7-BURLAP CLOTH MADE FROM JUTE OR KENAF FOR CURING CONCRETE:

The burlap cover shall be clean and free of defects. The cover shall provide a water retention blanket over the concrete. Acceptance will be based on visual inspection.

707.8-WATERPROOF PAPER FOR CURING CONCRETE:

Waterproof paper shall consist of two sheets of kraft paper cemented together with bituminous material and reinforced with fiber. The top surface shall be white. Acceptance will be based on visual inspection.

707.9-LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE:

Curing compounds shall conform to the requirements of AASHTO M148, Type 2, Class A.

707.10-WHITE POLYETHYLENE SHEETING (FILM) FOR CURING CONCRETE:

The sheeting shall be opaque white plastic film. The film shall be clean and free of imperfections. Acceptance will be based on visual inspection.

707.11-EPOXY RESIN PROTECTIVE COATING:

The material shall conform to the requirements of ASTM C881, Type III, Grades 1 or 2, Class B or C. Pigmentation shall be required in the system so the cured coating shall conform to Federal Color Standard 595, No. 16357.

707.12- Concrete Sealer:

707.12.1 – General: The material shall be a one component, water repellant penetrating sealer, meeting the criteria for Series II and Series IV (southern climate testing procedure) tests as referenced in NCHRP 244. The material shall be capable of meeting the criteria with a single coat and shall not alter the color of the treated surfaces.

707.12.2 – Acceptance: When using a sealer not on the Division's approved list, the Contractor shall furnish certified laboratory test data showing the material approved for the use meets the NCHRP 244 criteria at the manufacturers recommended rate of application.

SECTION 708
JOINT MATERIALS

708.1-PREFORMED EXPANSION JOINT FILLER FOR CONCRETE:

708.1.1-Nonextruding and Resilient Nonbituminous Type: The material shall conform to the requirements of AASHTO M 153. The sampling frequency shall be on the basis of one sample per each day of amanufacturers production for each thickness.

708.1.2-Nonextruding and Resilient Bituminous Type: The material shall conform to the requirements of AASHTO M 213. The sampling frequency shall be on the basis of one sample per each day of amanufacturers production for each thickness.

708.2-PREFORMED ELASTOMERIC JOINT SEALS; LUBRICANT-ADHESIVES:

708.2.1 - Joint Seals for Concrete Pavements: This material shall meet the requirements of AASHTO M 220. The lubricant - adhesive shall be of the type recommended by the seal manufacturer.

708.2.2 - Joint Seals for Bridges: Multiple web design and strip seals shall meet the requirements of AASHTO M 297. The compression-deflection and recovery tests for strip seals are deleted. The lubricant-adhesive shall be of the type recommended by the seal manufacturer.

708.3-JOINT SEALANT, HOT-POURED FOR CONCRETE AND ASPHALT PAVEMENTS:

This material shall meet the requirements of ASTM D3405.

708.4-SILICONE JOINT SEALANT; JOINT BACK-UP MATERIAL:

708.4.1-Silicone Joint Sealant:

708.4.1.1-General Requirements: Silicone sealant shall be furnished in a one part formulation. The compound shall be compatible with the surface to which it is applied. Acid cure sealants are not acceptable for use on concrete.

Silicone sealants shall be of the following types:

Type I-A low modulus non-sag silicone for use in sealing horizontal and sloping joints in portland cement concrete pavements. Tooling is required.

Type II-A very low modulus self leveling silicone used to seal horizontal joints in portland cement concrete pavements.

Type III-An ultra low modulus self leveling silicone used to seal horizontal joints in portland cement concrete pavements. It can also be used to seal joints between portland cement concrete pavement and asphalt concrete shoulders.

708.4.1.2-Test Requirements: The sealant shall meet the following requirements.

TEST METHOD	TEST	TYPE I	TYPE II	TYPE III
ASTM D2202	Flow	0.3 In. (7.6 mm) Max	Self-Leveling	Self-Leveling
ASTM C679	Tack Free Time	1.5 Hours Maximum		
Manufacturer Note 1	Skin Over Time		2 Hours Maximum	2 Hours Maximum
ASTM D412 Die C Notes 2 & 3	Modulus @ 150% Elongation	45 PSI (310 kPa) Max	40 PSI (276 kPa) Max	15 PSI (103 kPa) Max
ASTM D412 Die C Notes 2 & 3	Elongation	500% Minimum	500% Minimum	500% Minimum
ASTM D3583 Notes 2, 3, 4, 5	Adhesion To Concrete	No Failures @ 200% Elongation Minimum	No Failures @ 200% Elongation Minimum	No Failures @ 200% Elongation Minimum
ASTM C719 Note 6	Movement Capability 10 Cycles @ ± 50%	No Adhesive Or Cohesive Failures	No Adhesive Or Cohesive Failures	No Adhesive Or Cohesive Failures
ASTM C793 Notes 2 & 3	Accelerated Weathering 5,000 Hours	No Cracking	No Cracking	No Cracking

NOTE 1: The manufacturer shall verify that the sealant will have a skin over time within the time limitations under field conditions.

NOTE 2: Cure Temperature 77° ± 3° F (25±2 ° C) at 50 ± 5% Relative Humidity.

NOTE 3: Cure Time 21 Days Maximum.

NOTE 4: Specimens shall be 0.5 in. x 0.5 in. x 2.0 in (13 mm x 13 mm x 50 mm).

NOTE 5: Type III material shall also demonstrate adhesion to asphalt blocks.

NOTE 6: Type I material shall have movement capability 10 cycles @ +100%, -50%.

708.4.1.3-Acceptance: Manufacturers of silicone joint sealants shall submit certified test data during the first calendar quarter of each year. The testing

shall be performed by an independent testing laboratory. The test data must demonstrate that all requirements of the specifications are met. Only those sealants which have been evaluated and appear on the Division's approved list can be used on a project. Manufacturers are responsible for quality control of their product and the submission of test data in a timely manner in order to be considered for and/or continue to have their product on the approved list.

708.4.2-Joint Back-Up Material: Joint back-up material shall be compatible with the sealant. The material shall be the correct size to fit tightly in the joint to resist movement and to prevent the sealant from moving past the back-up material to the bottom of the joint.

708.5-VITRIFIED CLAY PIPE JOINTS HAVING RESILIENT PROPERTIES:

This material shall conform to the requirements of ASTM C 425.

708.6-HOT POUR MINERAL FILLED JOINT SEALER FOR SEWER AND CULVERT PIPE:

Hot pour mineral filled sealing compound shall conform to the requirements of Federal Specifications SS-S-169.

708.7-JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING FLEXIBLE WATERTIGHT GASKETS:

Joints for circular concrete sewer and culvert pipe shall conform to the requirements of AASHTO M 198.

708.8-JOINT MORTAR:

Joint mortar shall consist of one part cement and two parts sand, with water as necessary to obtain the required consistency. Sand shall conform to the requirements of 702.2. Cement shall conform to the requirements of 701.4 for masonry construction. For other uses cement shall conform to the requirements of 701.1 or 701.3.

Mortar shall be used within 30 minutes after its preparation.

708.9-ASPHALT PLASTIC CEMENT:

708.9.1 - General Requirement: Asphalt plastic cement is intended for use as a joint sealer for concrete and masonry. It shall consist of an asphalt base, volatile petroleum solvents, and mineral stabilizers, mixed to a smooth, uniform consistency, suitable for trowel application.

708.9.2 - Composition:

	Minimum	Maximum
Nonvolatile Matter, %	70	
Mineral Matter (Ash), %	15	45

708.9.3 - Physical Requirements:

Uniformity - A thoroughly stirred sample shall show no separation of solvent or setting that cannot be overcome by moderate stirring after standing for 6 hours at room temperature in a closed container.

Workability - The asphalt plastic cement shall spread readily without drawing or pulling when applied to a metal test panel and spread to a thickness of approximately ⅛ inch (3 mm).

Behavior at 60° C (140° F) - A sample cured at room temperature for one hour, and heated in a (60° ± 2° C) oven for five hours shall show no blistering and not more than ¼ inch (6 mm) sagging or slipping.

Behavior at 0° C (32° F) - After completion of the 60° C behavior test, the sample shall be cooled to 0 ± 2° C for one hour. Immediately after this exposure, the sample shall be bent around a 1 inch (25 mm) diameter mandrel. The sample shall show no cracking of the asphalt or separation of the asphalt from the panel.

708.9.4 - Test Methods:

Nonvolatile matter - Test in accordance with ASTM D 2822.

Ash - Transfer approximately 5 grams of the sample (weighed to the nearest 0.01g) to a crucible and heat at a low temperature (not above a dull red heat) until all carbon is consumed. Cool in a desiccator, weigh and calculate the percentage of ash.

708.10-WATERSTOPS (ELASTOMER MATERIAL):

All waterstops shall be produced by a molded or extrusion process such that, as supplied for use, they will be dense, homogenous, and free from holes and other imperfections. The cross section of the waterstop shall be uniform along the length and shall be symmetrical transversely so that the thickness at any given distance from either edge of the waterstop will be uniform. One three foot (meter) sample shall be furnished for each 1,000 ft. (300 meters), or fraction thereof, of each size of waterstop material.

The waterstops shall conform to the requirements in Table 708.10.1 for the polyvinylchloride waterstops and Table 708.10.2 for rubber waterstops.

TABLE 708.10.1-POLYVINYLCHLORIDE WATERSTOPS

PROPERTY	VALUE	TEST METHOD
Tensile Strength, Die "C", psi (Mpa)	1,400 (9.6) min.	ASTM D 412
Ultimate Elongation, Die "C", percent	280 min.	ASTM 412
Cold Bend Test	No Cracking	**

** The cold bend test shall be made by subjecting three full-width, one-inch long sample specimens to a temperature of 20°F for two hours. The specimen shall then be bent 180° around a ½ in. mandrel

TABLE 708.10.2-RUBBER WATERSTOPS		
PROPERTY	**VALUE**	**TEST METHOD**
Tensile Strength, Die "C", psi (Mpa)	2,000 (14) min.	ASTM D 412
Ultimate Elongation, Die "C", percent	360 min.	ASTM 412
Shore Durometer Hardness, Type A	60-85	ASTM D 2240
Absorption of Water, by Weight, percent	5 max.	ASTM D 570
Weight per linear ft.	0.67 lb. (0.3 kg) min.	--------